Installation guide

Deskstar 22GXP & 25GP

AT/IDE

Models: DJNA-352500, DJNA-352030, DJNA-351520, DJNA-351010
DJNA-350510, DJNA-372200, DJNA-371800, DJNA-371350
DJNA-370910, DJNA-370450

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Introduction

This manual was prepared to help you install your IBM Deskstar 22GXP or 25GP hard drive in most computer systems. If you do not feel comfortable installing this drive yourself, contact a qualified installer to assist you.

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Technical information about IBM hard disk drive products can be obtained via the Internet at:

http://www.ibm.com/harddrive

or by calling the IBM Hard Disk Drive Technical Support Center at 888.426.5214.

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Hardware description

The Deskstar 22GXP and 25GP are available in various models with the following options:

Capacity	Model	RPM
22GB	DJNA-372200	7,200
18GB	DJNA-371800	7,200
13.5GB	DJNA-371350	7,200
9.1GB	DJNA-370910	7,200
4.5GB	DJNA-370450	7,200
25GB	DJNA-352500	5,400
20.3GB	DJNA-352030	5,400
15.2GB	DJNA-351520	5,400
10.1GB	DJNA-351010	5,400
5.1GB	DJNA-350510	5,400

The Deskstar 22GXP and 25GP family has an advanced Ultra ATA interface that supports transfer rates of up to 66.6 MB/sec. To take advantage of the higher transfer rate, your computer will need to have a controller that supports the Ultra ATA/66 interface and a 40-pin, 80 conductor cable. If you have an older interface such as Multi-word DMA Mode-2, PIO Mode-4, or Ultra ATA/33 the drive will still function, but will be limited to data transfer speeds significantly lower than 66.6MB/sec due to the lower speed of your controller. If you have a slower controller, you may wish to purchase an Ultra ATA/66 controller card to take advantage of Deskstar's 66.6MB/sec data transfer rate. An Ultra ATA/66 controller card will fit into any available slot in your computer. At this printing, Promise Technology is the only company offering an Ultra ATA/66 controller card. For more information, see their Web site at:

http://www.promise.com

The Deskstar 22GXP and 25GP are designed for desktop applications that demand advanced data storage solutions, such as audio/video editing, computer-aided design and manufacturing (CAD/CAM), 3D graphics, animation and photo manipulation, Web page design, or data mining and warehousing. They are ideal for use in entry servers, entry workstations, and desktop personal computers.

The Deskstar 22GXP and Deskstar 25GP families are designed to work with MMX systems. Compatibility listings are included in the Appendix. Before you begin installation, please read the "Hard disk drive handling guide" on the following page.

Hard disk drive handling guide

These notes are designed to provide a simple overview of the need for caution when handling a disk drive.

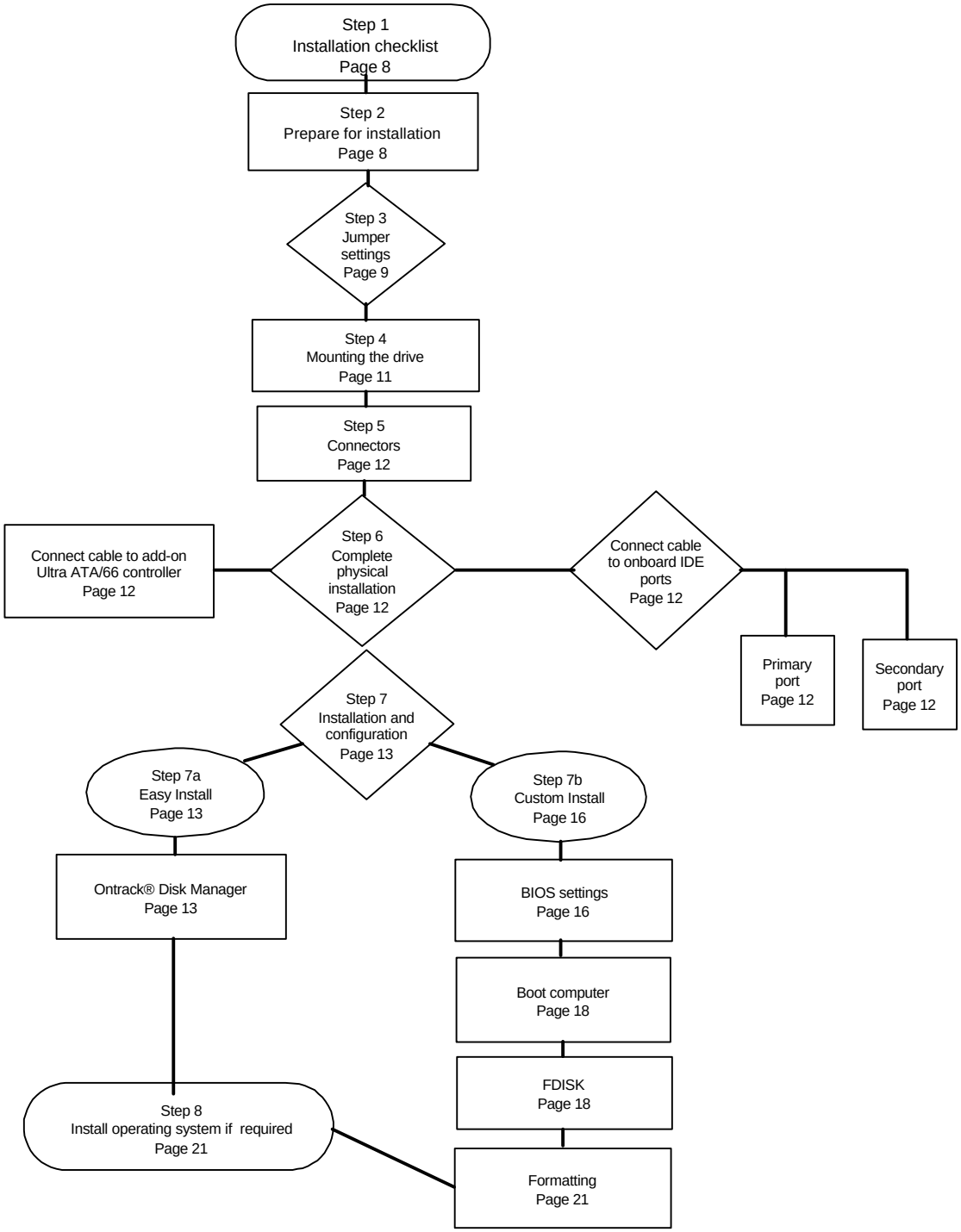
Disk drives can be easily damaged by electrical static shock or rough handling. In order to minimize the risk of damage to a disk drive, it is essential that the drive be handled while resting on a cushioned, electrostatically safe surface. Examples of static-safe mats available at the time of this printing are 3M's 8210 table mat and 3M's "First Touch" computer pad.

Great care should be taken when handling disk drives. Do not bump them against any object. When attaching brackets or mounting the drive in the computer, be very careful. It is *very easy* to unintentionally introduce shocks which exceed specifications.

Please note that the capacity of each disk drive to withstand electrical or mechanical shock varies according to its design. The IBM Hard Disk Drive Technical Support Center can advise you on the suitability of your Deskstar drive for a specific application.

Damage incurred to a drive might not be immediately evident and could cause the drive to fail months later.

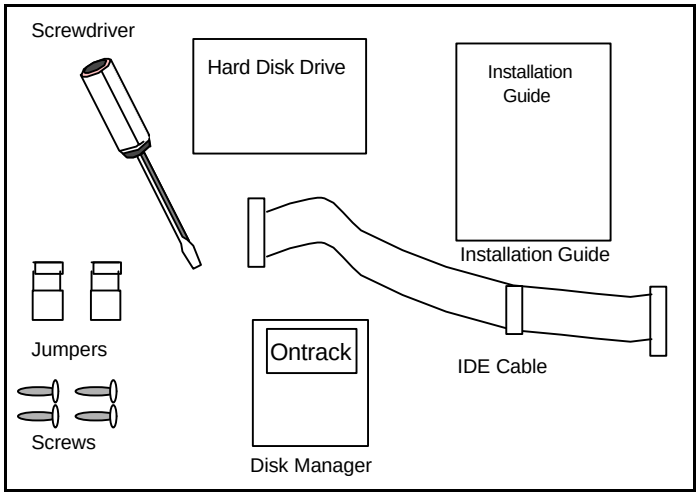
Hard disk drive installation flow chart



Step 1: Installation checklist

To install the Deskstar drive you may need the following items depending on your computer:

- The installation kit (as shown in the diagram below) containing the Deskstar drive, 4 mounting screws, IDE cable, Ontrack® Disk Manager, and any related publications. Save the box the drive came in.



- The documentation that came with your computer or storage enclosure.
- A small, flat-blade screwdriver.
- An IDE controller, which is either built in or an adapter inside your computer, and any related documentation.
- Mounting brackets, if required for your computer. Contact your place of purchase if you are not certain if mounting brackets are required.
- A bootable DOS diskette. (See the section entitled *Making a Bootable Diskette* in the Appendix.)
- If you are replacing an older internal drive with the new Deskstar drive and want to copy all of the files from the older drive to your new one, you may need additional software. (See the section entitled *Drive Copy* in the Appendix.)

Step 2: Prepare for installation

Begin by backing up your existing drive to avoid any loss of data during installation. (See the section entitled *Backup and Restore* in the Appendix.) After completing the backup, shut down as normal.

Opening your computer

- Turn the system off.
- Unplug the power cord from the wall outlet.
- Remove all cables from the back of your computer, labeling them if necessary.
- Remove the cover from your computer. (Consult your user's guide for instructions if needed.)

Unpackaging your hard drive

- If available, use an ESD (Electronic Static Discharge) wrist strap while handling your drive.
- If an ESD wrist strap is not available, discharge static electricity by establishing a common voltage between your body and the hard drive. Simultaneously touch the hard drive in its anti-static bag and an unpainted metal surface on the outside of your computer system with your bare hands.
- Remove the drive from the anti-static package that it was shipped in. Handle the drive only by the sides and avoid excessive movement until the drive has been mounted.
- Do not touch the main computer chip board.
- Do not drop the drive. A drop from *only 1/4 inch* could permanently damage your hard drive.
- Place the drive carefully on a static free area.
- Record the following information:

  Drive Model _____ Date of Purchase_____
  Drive P/N _____ Place of Purchase_____
  Serial # _____

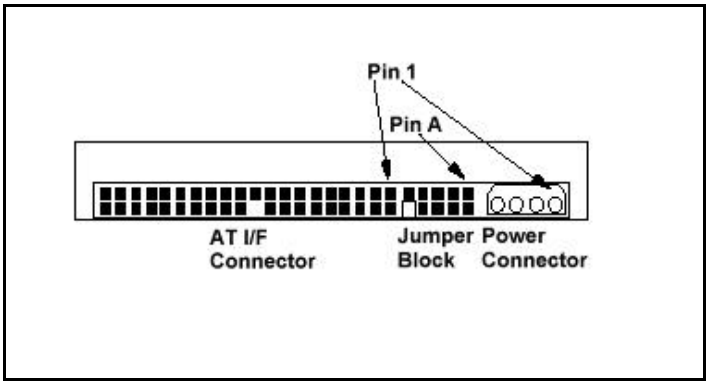
- If you currently have a hard drive in your system you may want to record the CMOS settings. This information is in your BIOS setup. You can enter your BIOS setup by pressing the key sequence for your system while booting. (See *Custom Install on page 16.)*

  Cylinders _____ Sectors/Track_____
  Heads _____ Landing Zone _____
  Write Pre Comp (if you have this category) _____

Note:*Do not low-level format your drive!* IBM drives are low-level formatted by the manufacturer and reformatting may cause permanent damage to your drive and your system. (See the section entitled *Utilities* in the Appendix.)

Step 3: Jumper settings

The jumper settings are found on the hard drive next to the interface connector, as shown below.



Jumper settings are physical settings that must be changed for different uses of a hard drive. If your drive will be used as a single drive or as a boot drive, no changes are required. The drive is shipped with jumpers set for Master.

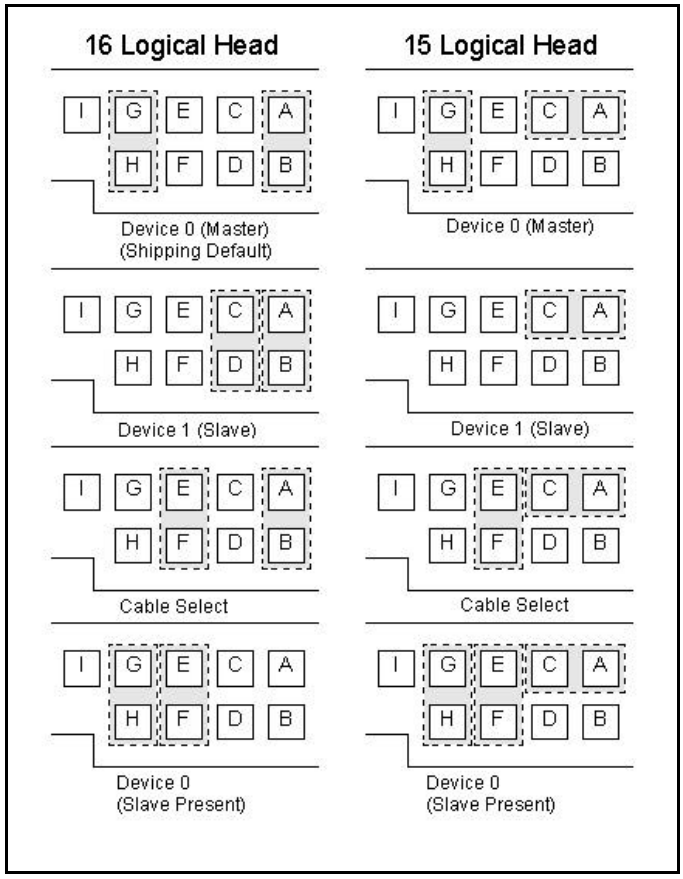
Master
This setting should be used if you are removing your current drive from the system and replacing it with the Deskstar drive. Place a jumper on pins A-B and G-H to make this drive the Master.

Slave
Use this setting if you want to retain your old drive as the boot drive and have the new drive available for program and data storage. Place a jumper on pins A-B and C-D to make this drive the Slave.

Cable Select
This setting should be used if your system requires special “cable select” cables. Place a jumper on pins A-B and E-F for Cable Select.

Slave Present
This setting should be used if your BIOS setup does not detect the slave drive. Place a jumper on pins E-F and G-H.

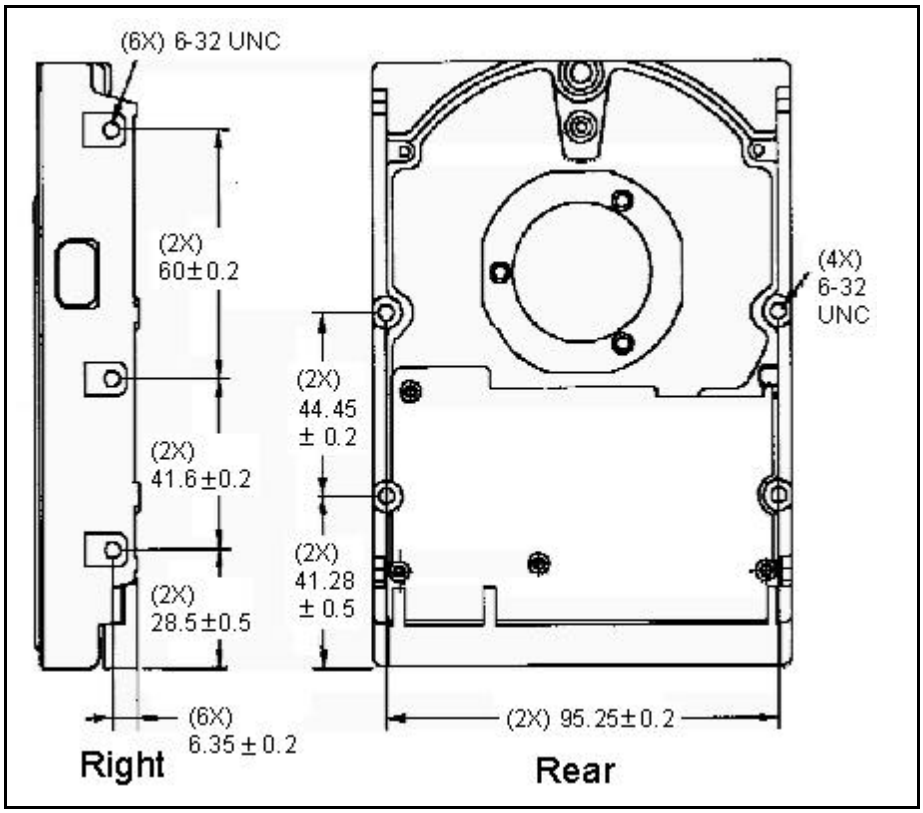
Some BIOSs have a limitation when translating the cylinder, head, and sector information which prevents them from correctly detecting the capacity of larger drives. If your BIOS is reporting the Deskstar's capacity incorrectly, use the 15 logical head settings rather than the 16 logical heads, shown below.



Jumper settings

Step 4: Mounting

After setting the jumpers, mount the hard drive in your system. The drive can be mounted with any of its six surfaces facing down. See below for mounting hole locations.



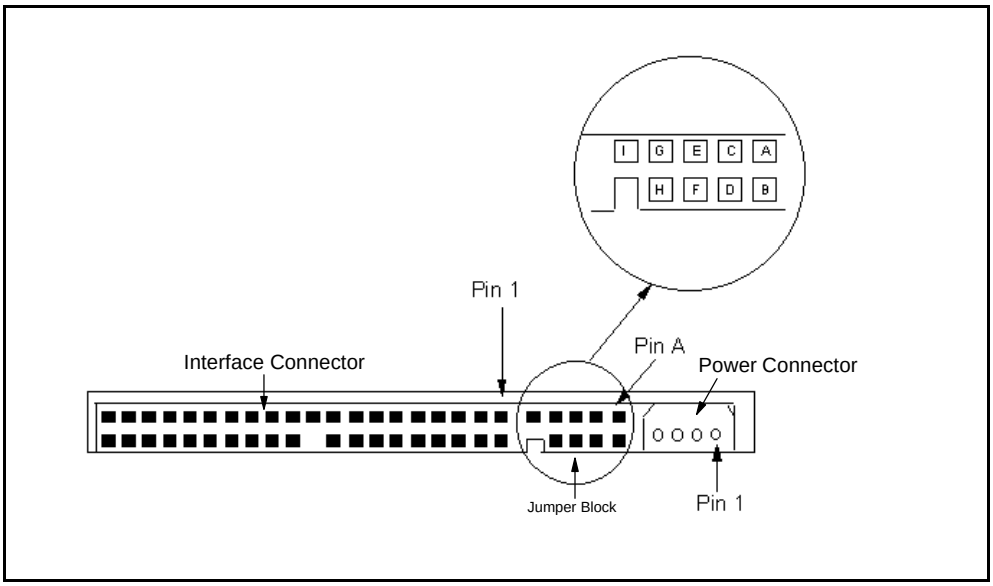
Mounting hole locations

You must ensure that the drive has sufficient air flow. Mount the drive in the system using four 6-32 UNC screws. The maximum screw length is 4.0 mm for the side holes and 4.5 mm for the bottom holes. Mount the drive securely enough to prevent it from excessive motion or vibration.

If you are mounting your drive in a 5 inch bay, you may need to purchase mounting brackets from your computer manufacturer for the drive to be mounted securely.

Step 5: Connectors

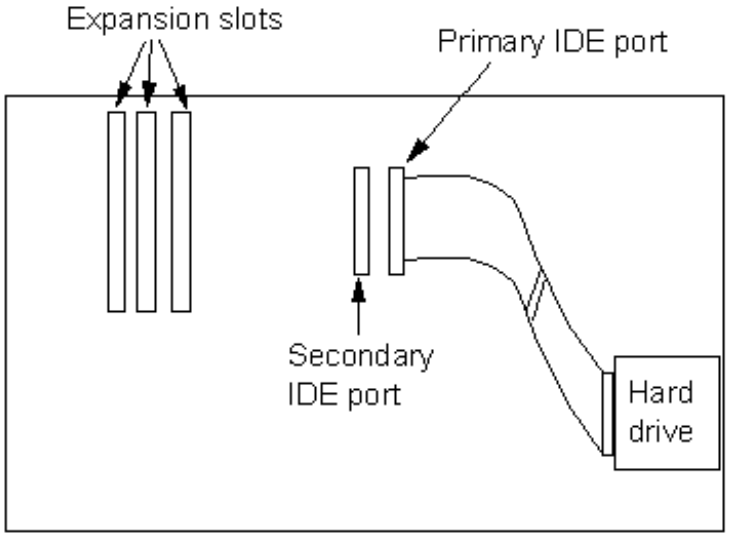
After the drive has been carefully mounted, connect the IDE cable (included) and the power cable to the drive. If you are using a cable already installed in your computer, ensure that the cable length does not exceed 18 inches (45.7 cm). (Note that the IDE connector and power connector are keyed for proper insertion.)



Connector locations

Step 6: Complete physical installation

Plug the cable into the onboard port. If you have added an Ultra ATA/66 controller card plug the cable into the controller. The figure below shows the possible location of the onboard ports. Each port is marked on the motherboard.



To take advantage of the Ultra ATA/66 transfer rate available with the Deskstar 22GXP and 25GP, an add-on Ultra ATA/66 controller must be used. This card can be plugged into one of the expansion slots. The Deskstar drive would then be connected to the Ultra ATA/66 card rather than the primary or secondary slot on the motherboard.

If you are not using an Ultra ATA/66 card, plug the IDE cable into one of the two available slots on the motherboard. The first two devices should be connected to the "primary" slot and the second two devices should be connected to the "secondary" slot. These devices may be hard drives, CD-ROMS, or removable drives.

Complete the physical installation by replacing the cover on the computer, connecting all cables, and plugging the power cord into the wall.

Step 7: Installation and configuration

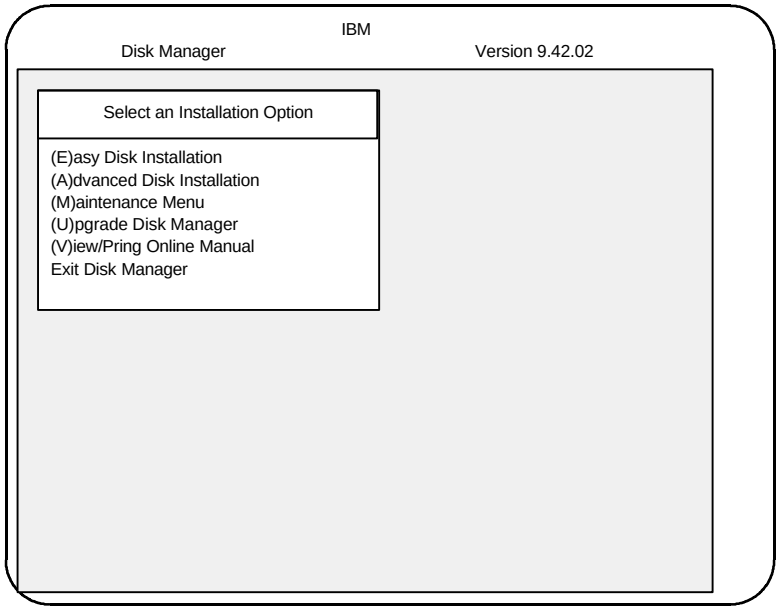
Step 7a: Easy install

When you purchased this drive from IBM, you received a copy of Ontrack® Disk Manager. This software is necessary if your BIOS does not support drives over 8.4 GB. This easy installation will use the Disk Manager diskette to partition and format your drive. If the easy installation does not work, or you choose not to use Disk Manager, continue to the section entitled *Custom Installation*.

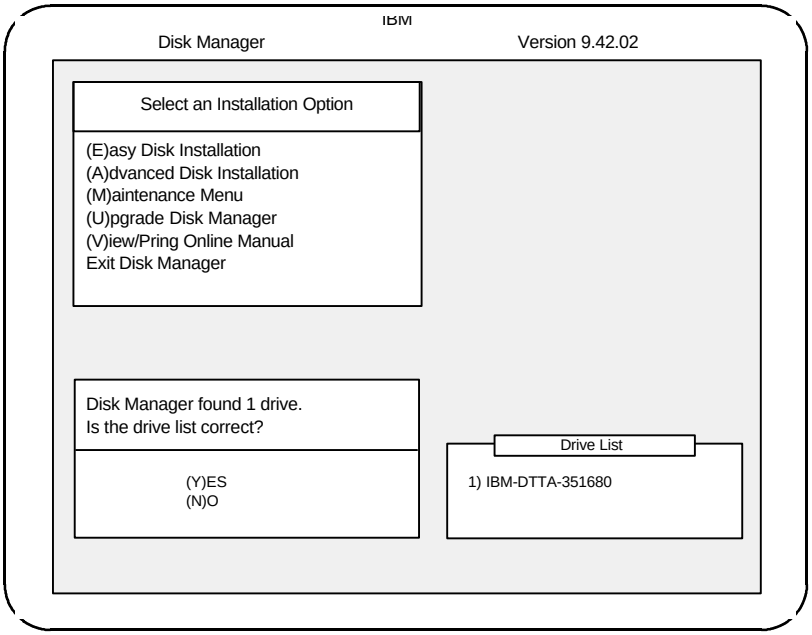
Ontrack ® Disk Manager

Turn on your computer after you have inserted the Ontrack® Disk Manager diskette. *Note: The following screen shots are examples and may not appear in the same format on your system.*

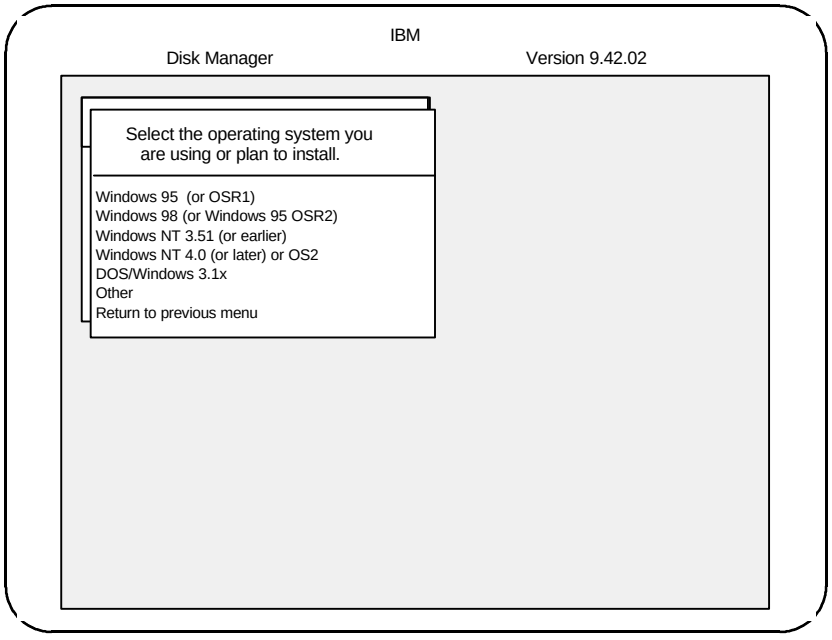
A large blue IBM screen will appear after several seconds, followed by the screen below. Select *Easy Disk Installation*.



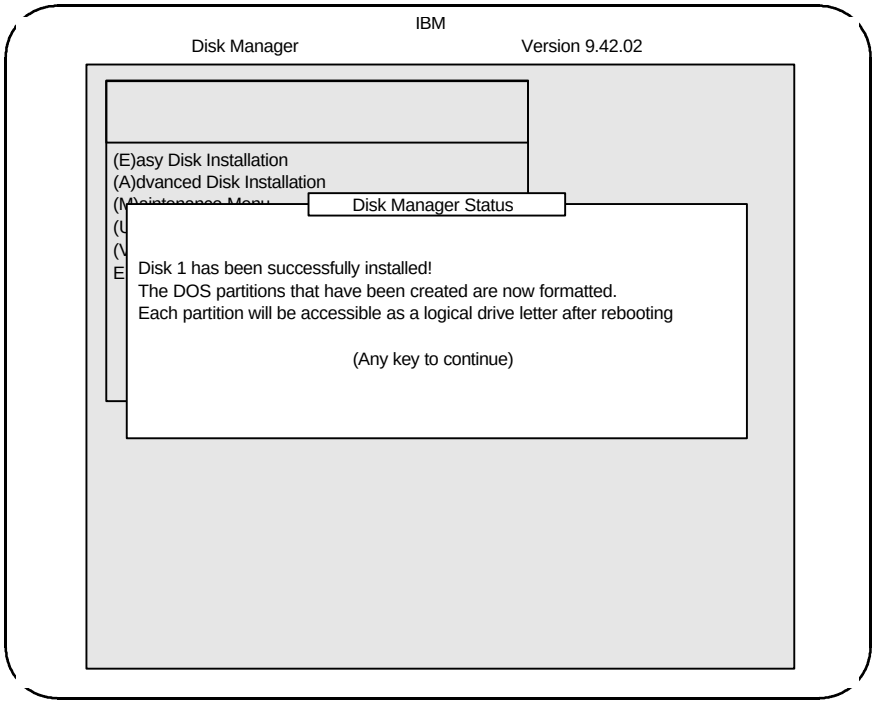
The screen on the following page will appear.



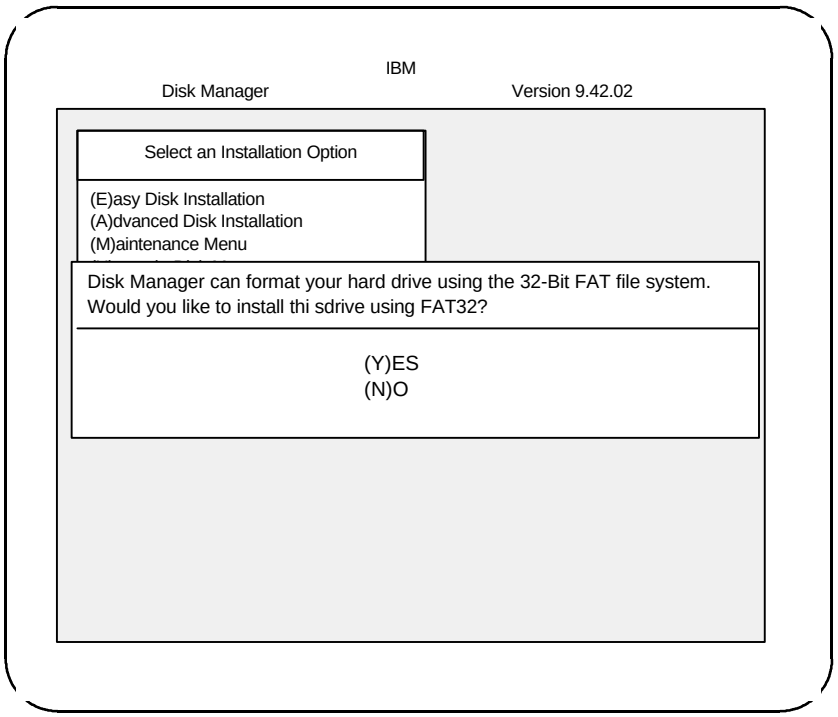
If the drive list is correct, select *(Y)es.* The screen shown below will follow.



Select the operating system you plan to install (or the operating system installed on an existing drive). If you are using Windows® 95 version B or Windows® 98, Disk Manager will create a FAT 32 file system which will allow you to create 1 partition using all existing space on your hard drive. If you do not wish to use the FAT 32 file system, you can select the FAT 16 file system by choosing *(N)o* from the following screen.


IBM
Disk Manager
Version 9.42.02
(E)asy Disk Installation
(A)dvanced Disk Installation
Disk Manager Status
Disk 1 has been successfully installed!
The DOS partitions that have been created are now formatted.
Each partition will be accessible as a logical drive letter after rebooting
(Any key to continue)

Select *(Y)es* to continue. After Disk Manager has finished partitioning and formatting your drive, the next screen will appear.



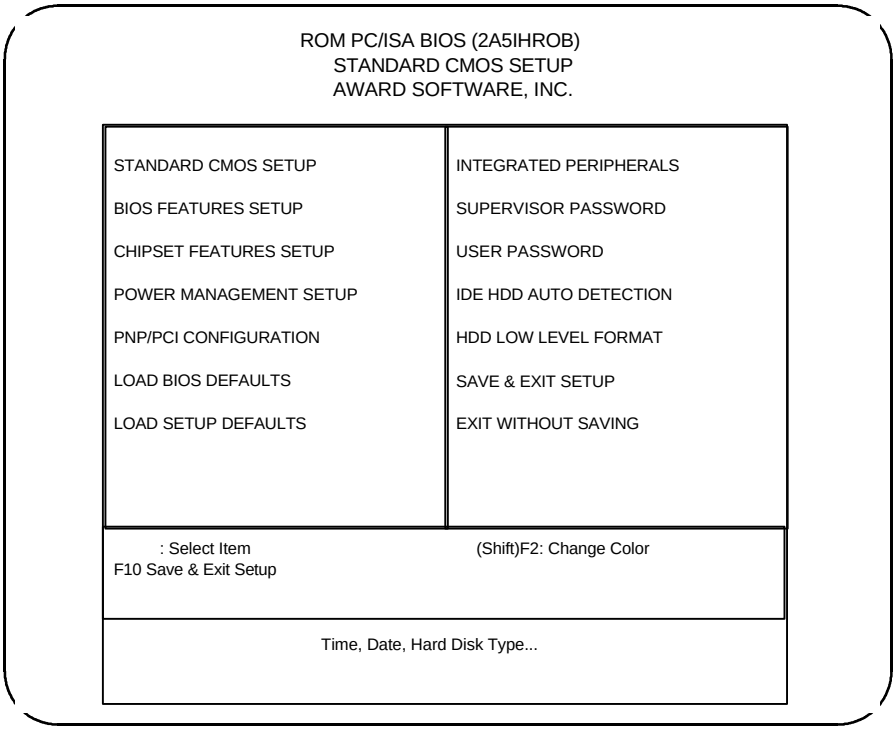
Your drive has now been partitioned and formatted. If there isn't already an operating system on an existing drive, load an operating system. (See the section entitled *Operating Systems* on page 21.)

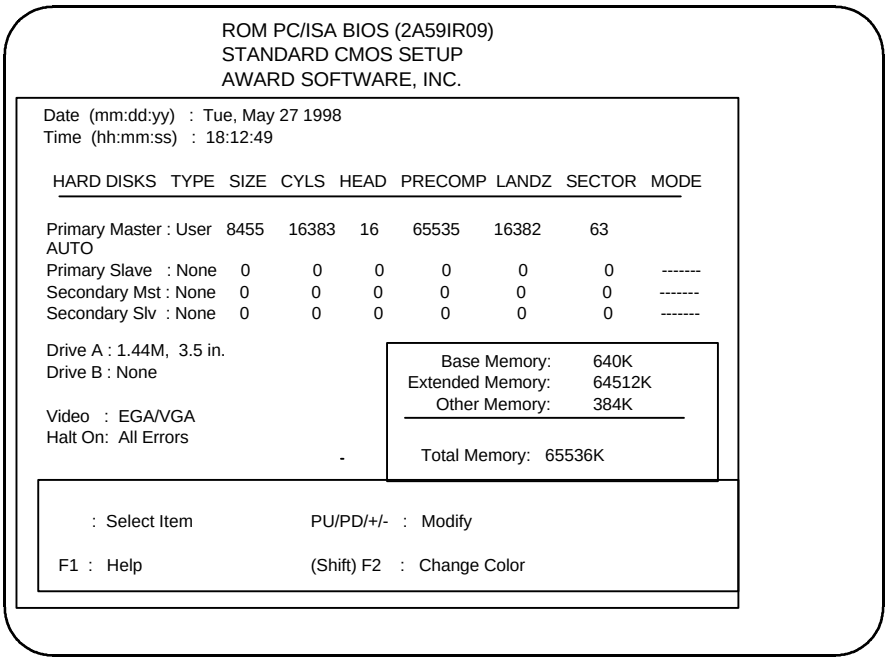
Step 7b: Custom install

If you do not wish to use Ontrack® Disk Manager, or if your system will install the drive without the overlay program, continue by checking your drive's settings in your BIOS.

BIOS settings

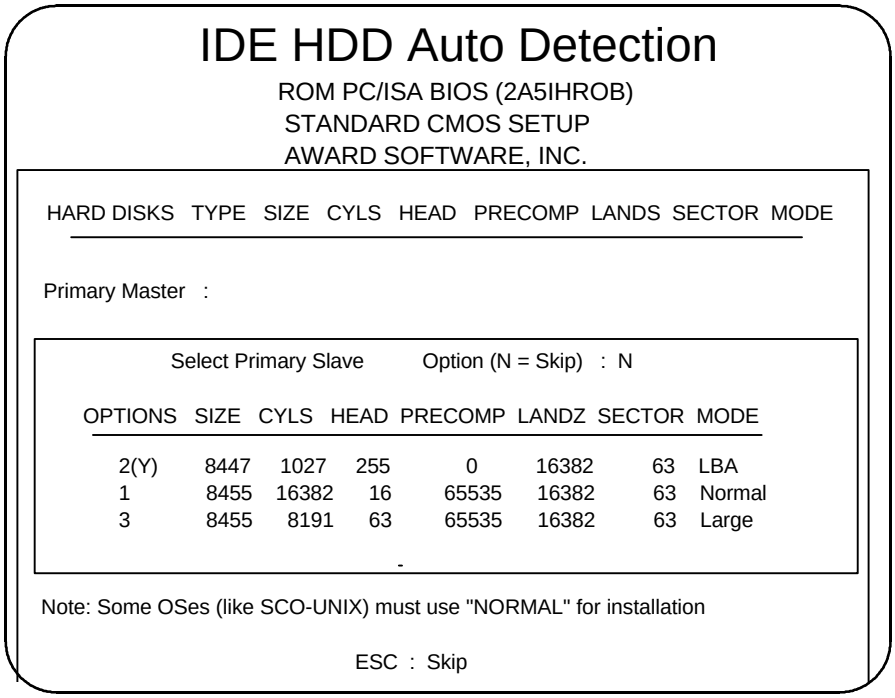
Begin by checking the CMOS settings. The example below is an Award© BIOS version 4.51. Other BIOSs should be similar. Follow the instructions provided with your system. To enter the CMOS setup screen press the key sequence designated by your system manufacturer (i.e. <*F1*>; <*DELETE*> <*ESC*>; <*CTRL*> <*ALT*> <*S*>) during the initial boot process. Select "Standard CMOS Setup". This selection will bring up the following screen.




ROM PC/ISA BIOS (2A59IR09)
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.
Date (mm:dd:yy) : Tue, May 27 1998
Time (hh:mm:ss) : 18:12:49
HARD DISKS TYPE SIZE CYLS HEAD PRECOMP LANDZ SECTOR MODE
Primary Master : User 8455 16383 16 65535 16382 63 AUTO
Primary Slave : None 0 0 0 0 0 0 -------
Secondary Mst : None 0 0 0 0 0 0 -------
Secondary Slv : None 0 0 0 0 0 0 -------
Drive A : 1.44M, 3.5 in.
Drive B : None
Video : EGA/VGA
Halt On: All Errors
Base Memory: 640K
Extended Memory: 64512K
Other Memory: 384K
Total Memory: 65536K
: Select Item
PU/PD/+/- : Modify
F1 : Help
(Shift) F2 : Change Color

The above example shows an 8455MB drive connected to the primary port on the motherboard and set as a Master drive. The drive used in this example has a capacity of 16.8 GB. This BIOS will not recognize capacities over 8.4 GB. Ontrack® Disk Manager will be needed to overcome the limitation. (Go back to the section entitled *Easy Installation*.)

If the previous screen shows a drive other than the Deskstar 22GXP or 25GP or shows nothing at all, you will need to go into the “IDE HDD Auto Detection”. You can get there from the main menu of the BIOS setup.


IDE HDD Auto Detection
ROM PC/ISA BIOS (2A5IHROB)
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.
HARD DISKS TYPE SIZE CYLS HEAD PRECOMP LANDS SECTOR MODE
Primary Master :
Select Primary Slave Option (N = Skip) : N
OPTIONS SIZE CYLS HEAD PRECOMP LANDZ SECTOR MODE
2(Y) 8447 1027 255 0 16382 63 LBA
1 8455 16382 16 65535 16382 63 Normal
3 8455 8191 63 65535 16382 63 Large
Note: Some OSes (like SCO-UNIX) must use "NORMAL" for installation
ESC : Skip

Make a selection and return to the main menu. Click on “Standard CMOS Setup”. You will see that the BIOS recognizes only 8455 MB and will need to use Ontrack® Disk Manager for the entire 16 GB to be recognized. (Go back to the section entitled *Easy Installation*.)

If you can answer “yes” to any of the following, proceed with FDISK.

- You have purchased a smaller capacity drive (under 8.4 GB) and the BIOS recognizes the correct capacity.
- Your BIOS recognizes the full capacity of the drive.
- You have connected your drive to an Ultra ATA/66 card.

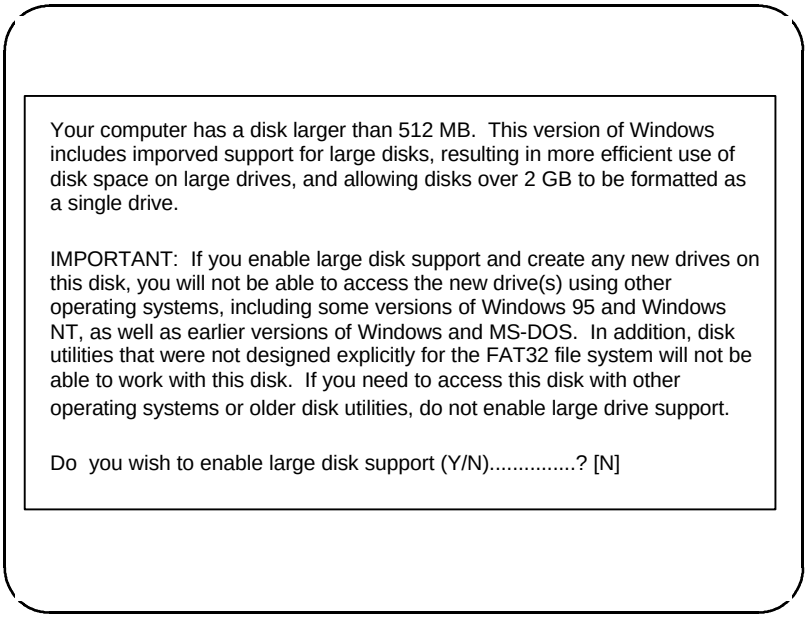
Press [ESC] to continue and then select *Save and Exit.*

Boot computer

Turn on your computer after you have inserted a bootable diskette such as DOS or your Windows® startup diskette. You will need to use Windows® 95 OS/R2 or Windows® 98 FDISK for drives larger than 8 GB. DOS FDISK will not recognize drives larger than 8 GB.

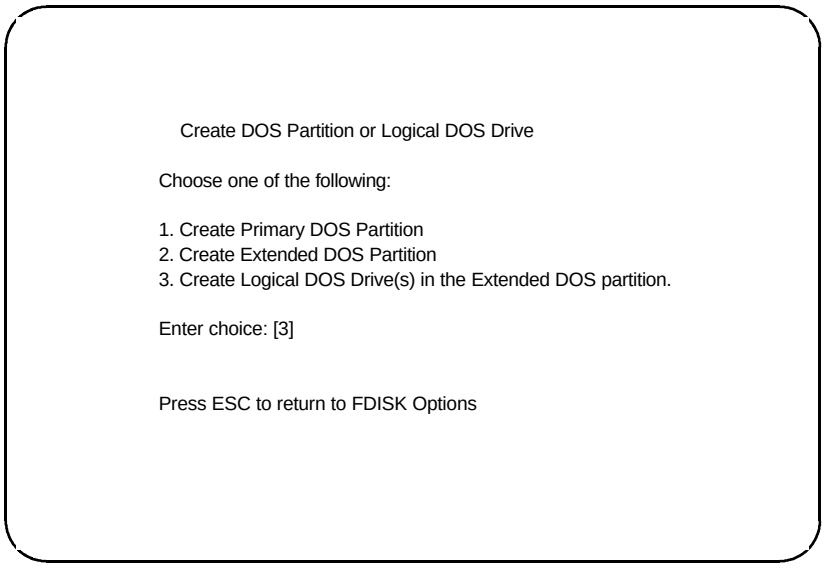
FDISK

Type FDISK at the A:\ prompt after booting to a bootable diskette. If Windows® 95 OS/R2 or Windows® 98 is used, the following screen will appear.

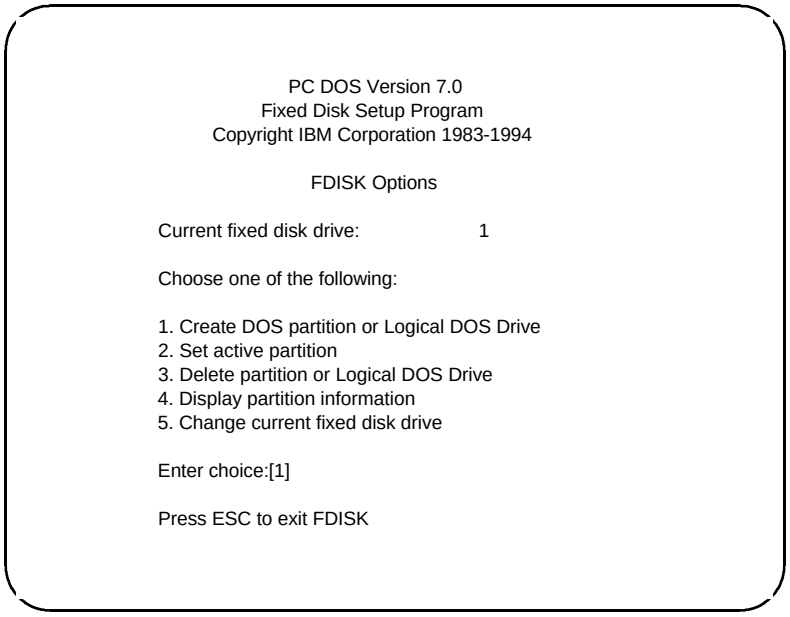

Your computer has a disk larger than 512 MB. This version of Windows includes imporved support for large disks, resulting in more efficient use of disk space on large drives, and allowing disks over 2 GB to be formatted as a single drive.
IMPORTANT: If you enable large disk support and create any new drives on this disk, you will not be able to access the new drive(s) using other operating systems, including some versions of Windows 95 and Windows NT, as well as earlier versions of Windows and MS-DOS. In addition, disk utilities that were not designed explicitly for the FAT32 file system will not be able to work with this disk. If you need to access this disk with other operating systems or older disk utilities, do not enable large drive support.
Do you wish to enable large disk support (Y/N).....? [N]

Type *Y* to select the FAT 32 file system. Type *N* to select the FAT 16 file system.

The following screen allows you to create partitions. You will have five options if you have more than one drive. Option 5 allows you to select the drive you wish to partition.

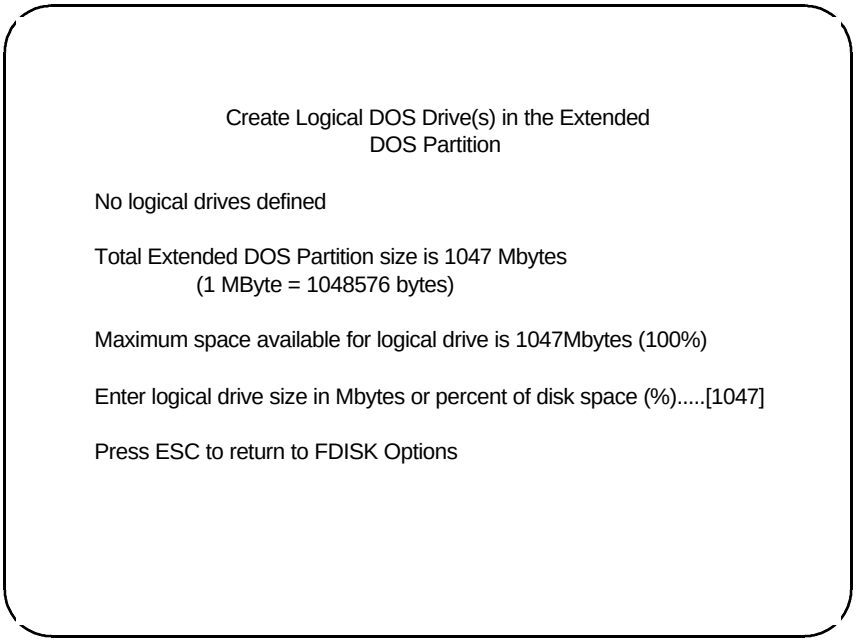

Create DOS Partition or Logical DOS Drive
Choose one of the following:
1. Create Primary DOS Partition
2. Create Extended DOS Partition
3. Create Logical DOS Drive(s) in the Extended DOS partition.
Enter choice: [3]
Press ESC to return to FDISK Options

Select option 1 to *Create DOS partition*.


PC DOS Version 7.0
Fixed Disk Setup Program
Copyright IBM Corporation 1983-1994
FDISK Options
Current fixed disk drive: 1
Choose one of the following:
1. Create DOS partition or Logical DOS Drive
2. Set active partition
3. Delete partition or Logical DOS Drive
4. Display partition information
5. Change current fixed disk drive
Enter choice:[1]
Press ESC to exit FDISK

Select option 1 to *Create Primary DOS Partition*. If this is to be the boot drive, set this partition to "Active".

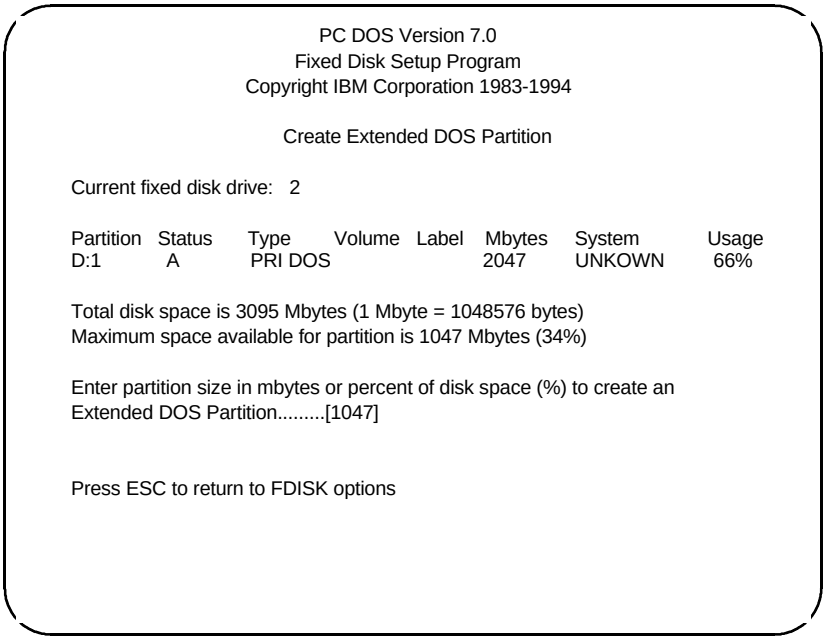
Press [ESC] to return to the FDISK options. Create an *Extended DOS Partition* by selecting option 1 from the main menu and option 2 from the second menu. (Both menus shown above.)


Create Logical DOS Drive(s) in the Extended
DOS Partition
No logical drives defined
Total Extended DOS Partition size is 1047 Mbytes
(1 MByte = 1048576 bytes)
Maximum space available for logical drive is 1047Mbytes (100%)
Enter logical drive size in Mbytes or percent of disk space (%).....[1047]
Press ESC to return to FDISK Options

The previous example is based on the Deskstar 16GP model DTTA-350320 which is a 3.2 GB drive.

Note that the Maximum Capacity shows only 3099 MB instead of 3240 MB. This is because some system BIOSs recognize a Megabyte as 1,048,576 bytes (binary). Drive manufacturers recognize a Megabyte as 1,000,000 bytes (decimal). The capacities are the same in actual number of bytes.

After creating the *Extended DOS Partition,* press [ESC] to return to the FDISK main menu. Select option 1 to create a *Logical DOS Drive*, then option 3 to create a *Logical DOS Drive in an Extended Partition*.


PC DOS Version 7.0
Fixed Disk Setup Program
Copyright IBM Corporation 1983-1994
Create Extended DOS Partition
Current fixed disk drive: 2
Partition Status Type Volume Label Mbytes System Usage
D:1 A PRI DOS 2047 UNKOWN 66%
Total disk space is 3095 Mbytes (1 Mbyte = 1048576 bytes)
Maximum space available for partition is 1047 Mbytes (34%)
Enter partition size in mbytes or percent of disk space (%) to create an
Extended DOS Partition.....[1047]
Press ESC to return to FDISK options

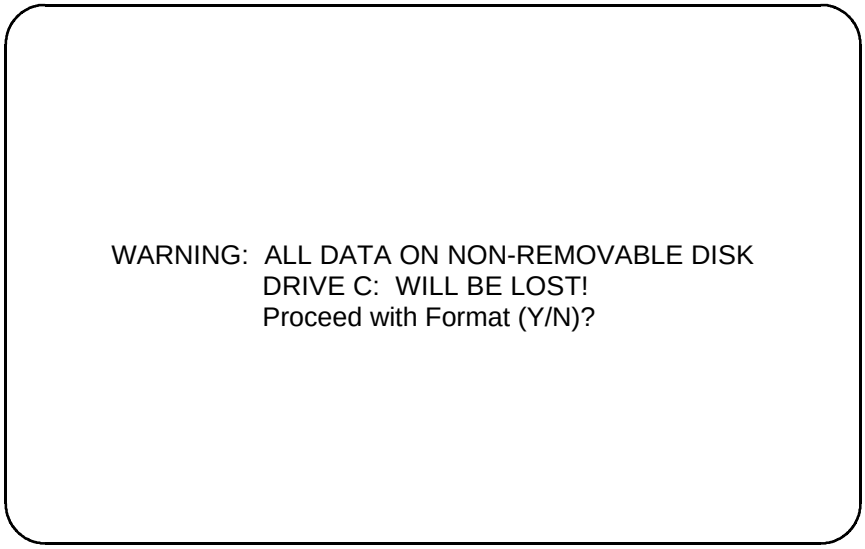
Press [ESC] to return to FDISK and [ESC] again to restart the system. The system must be restarted for the partitions to be recognized.

Formatting

The drive will need to be formatted before an operating system can be loaded. Format the Primary partition and any Extended partitions that have been made. *Note: If you have used Ontrack® Disk Manager, the drive has been automatically formatted.*

Refer to FDISK, option 4 to display the partition information. This is helpful to review drive letter assignments. Note the drive letters to ensure proper formatting.

Press [ESC] to return to the main menu and exit FDISK. At the A:\ prompt type *format x: /s* (where x is the drive letter). The /s option will make your hard drive bootable by copying the system files to the hard drive. If you do not want this drive to be bootable, do not use the */s* command. You will see the following warning:



Type *Y* for yes. There should be no data on the new drive. The time it takes to format the drive is dependent upon its size. When the drive has finished formatting, format the next logical drive, in this case D: by typing *format d:* You will get the same message. Select *Y.*

Step 8: Operating system installation

After the drive has been formatted, install an operating system. You may encounter the following issues.

Windows® 95

Windows® 95 must be version OSR2 or later to support a drive larger than 8.4 GB.

OS/2 and OS/2 Warp

OS/2 Warp 4.0 only sees 7.9GB of the drive. The latest driver in Fixpak 10 will fix this problem. It is available from the Online Device Driver Pack at:

http://www.software.ibm.com/os/warp/

Appendix

Making a bootable DOS diskette

If you do not have a DOS bootable diskette, you may want to make one. Your Ontrack® diskette is bootable and will eliminate the need for creating this diskette. This will be necessary for installing your new hard disk drive and in case of system failure. The DOS bootable diskette will contain files necessary to boot your system. These files are called system files. You will also want some utilities on your bootable diskette. Follow these instructions to add both the system files and the other helpful utilities.

- Make sure your computer is on and you insert a diskette in drive A.
- At the C:\ prompt, type *FORMAT A: /S* and press ENTER
- Press [ENTER] again, unless you want to label your diskette.
- Add the utilities. To do so, use some simple copy commands.
  - Type *cd Windows* at the C:\ prompt, press [ENTER].
  - Type *copy fdisk.exe a:,* press [ENTER].
  - Type *copy format.com a:*, press [ENTER].
  - Type *copy sys.com a:*, press [ENTER].
  - Type *copy chkdsk.exe a:*, press [ENTER].
  - Type *copy debug.exe a:,* press [ENTER].
- Type *cd.*
- Remove diskette from drive A:
- Write protect the diskette by sliding the small plastic tab on the diskette in the up position.
- Test the diskette.
  - Turn off your computer.
  - Insert the diskette in drive A:
  - Turn on your computer.
  - When you get to the A:\ prompt *type c:*, press [ENTER].
- If any of these steps did not work, start again at step 1.

Jumper block information

The jumper block is a block of pins located on the hard drive that when shorted with a shunt (jumper) will make the drive behave in certain ways. The shunt is a small piece of plastic with metal inside that shorts out the connection between 2 pins when placed over them. These can be purchased at any local computer store. The pin pitch is 2 mm.

Controller information

The examples in this guide have used IDE ports that are imbedded in the motherboard. To take advantage of the Ultra ATA/66 transfer rate offered by the Deskstar 22GXP and 25GP, you will need to purchase an Ultra ATA/66 controller card (host adapter). You will need to install the controller in one of the empty slots in your computer. Remove the screw holding the metal plate in place and insert the

controller into the appropriate PCI, EISA or ISA slot on the motherboard, making sure the metal plate from the controller fits into the grooves on the computer frame. Replace the screw and connect the IDE cables to the controller and then the hard drive. If you have any questions, refer to the installation manual enclosed with your controller.

Backup and restore
One of the most common methods of backup is tape backup. Tape drives are available from IBM and other major manufacturers. This method is preferred for overnight backups that run while your business is closed or while you sleep.

Another method of backup is a removable drive. Two examples are the ZIP drive and the JAZ drive, both manufactured by IOMEGA. These drives can be used for backup and can be attached or removed with little trouble.

Utilities
Your Deskstar drive comes low-level formatted and free of defects. *Note: Do not attempt to low-level format your drive.* If data must be removed from the drive, there are two utilities available from the Hard Disk Drive Technical Support Center Web site at:

www.ibm.com/harddrive

ZAP
Zap is a utility that will overwrite the first 128 sectors of your hard drive with zeros.

WIPE
Wipe will write zeros to every sector on your hard drive up to 8GB.

These utilities should be sufficient to return your drive to factory shipped condition.

Drive copy
If you are replacing an existing hard drive with the Deskstar drive, you may want to copy all your files from the existing drive to the Deskstar. There are several software programs available that copy one drive to another.

PowerQuest Drive Copy 2.0
http://www.powerquest.com/product/dc.index.html
This utility supports all operating systems, has mouse support, selective partitioning, selective sector copying, and automatically creates a new DOS reboot disk. This utility is not limited by drive size.

QuarterDeck Systems DiskClone
http://www.qdeck.com/qdeck/products/diskclone/indexreg.html
This utility supports all operating systems and has mouse support.

ITS Systems EZ-Upgrader
http://www.itechs-systems.com/
This utility can be used with Windows® 3.1 andWindows® 95 operating systems.

Image Systems Solutions Drive-to-Drive
http://www.img-systems.com/d2ddesc.htm
This utility is for use with all operating systems, but is limited to copying drives with similar physical geometry.

FWB software Drive Up!
http://www.fwb.com/
This utility is used with Windows® operating systems only.

Technical support

Before calling technical support make sure you have your drive part number, serial number and system information.

Contact technical support via:

Web	www.ibm.com/harddrive
Voice	888.426.5214 or 507.253.4110
Fax	507.253.4111
e-mail	drive@us.ibm.com

Support is also available in Singapore at:

Voice	(65) 840.9292
e-mail	drive@sg.ibm.com

Automated Fax Back Service

U.S.A.	408.256.5218
Singapore	800.1100.383
England	0800.96.6948
Germany	0130.82.6089
France	0800.902229
Italy	167.875148

Compatibility matrix

The IBM SIT Lab thoroughly tests Deskstar drives for compatibility with a wide variety of systems, system boards, operating system, and BIOS versions. Testing was done to demonstrate compatibility with the following hardware and software. Other combinations of hardware and software may function with this drive, but were not tested.

Systems

Apple Performa 631CD
Apple G3
Compaq Presario 4660
Compaq Desk pro EN
Compaq Desk pro EP
Dell Workstation 400
Dell Dimension XPS D300
Dell Optiplex GX 1
Dell Dimension R 400
Dell Workstation 410
Gateway G6-266
Gateway P6-233
Gateway P5-166
Gateway G6-350
Gateway GP6-400
HP Vectra XW6/200
HP Vectra VE& VL
HP Pavilion
HP Vectra
IBM Systems
Micron Millenia XKU
Micron Millenia 400
Micron Powerdign XSU
NEC Direction SPL 266

System boards

Acer AP5T
Aopen AX6B
Asus P2E-M
Asus P2B
Asus P2B-CS
Atrend ATC 622
ChainTech 6LTM
DFI P5-BV3+
Elite P6BX-A+
Epox EP
FIC PA-2006
Gigabyte GA-686BX
Intel AL440LX
Intel 440EX
Intel N440BX
Microstar MS-5168
Shuttle Spacewalker HOT591P
Soyo SY-6KB
Tekram-P6B40-A4X
Tyan S1572

Operating systems

MS DOS v6.22
PC DOS v6.3 & v7.0
OS/2 v4.0
System 7.5
MacOS 8
Novell Netware v3.12 & v4.1
SCO Open Desktop v3.0
SCO Open Server v5.0
SCO UNIX 3.2.4.2
SCO Unixware 2.1
Windows 95
Windows 98
Windows NT Workstation v3.51
Windows NT v4.0 and NT v5.0 (beta
AMI (multiple versions)
Apple
Award (multiple versions)
Compaq (multiple versions)
IBM Surepath
Phoenix (multiple versions)

Warranty

Statement of Limited Warranty
Part 1 - General Terms

This Statement of Limited Warranty includes Part 1 - General Terms and Part 2 - Country-unique Terms. The warranties provided by IBM in this Statement of Limited Warranty apply only to Machines you purchase for your use, and not for resale, from IBM or your reseller. The term "Machine" means an IBM machine, its features, conversions, upgrades, elements, or accessories, or any combination of them. The term "Machine" does not include any software programs, whether pre-loaded with the Machine, installed subsequently or otherwise. Unless IBM specifies otherwise, the following warranties apply only in the country where you acquire the Machine. Nothing in this Statement of Warranty affects any statutory rights of consumers that cannot be waived or limited by contract. If you have any questions, contact IBM or your reseller.

Machine - Deskstar HDD product.

Warranty Period* - Three year limited warranty.

To obtain warranty service for the Machine within the first thirty (30) days from the invoice date, contact IBM at 1-800-426-7235 ext. 4669. To obtain warranty service for the Machine after thirty days from the invoice date, contact IBM at 1-888-426-5214.

**Contact the above warranty telephone numbers for warranty service information. Some IBM Machines may be eligible for On-site warranty service depending on the country where service is performed.*

The IBM Warranty for Machines
IBM warrants that each Machine 1) is free from defects in materials and workmanship and 2) conforms to IBM's Official Published Specifications. The warranty period for a Machine is a specified, fixed period commencing on its Date of Installation. The date on your sales receipt is the Date of Installation, unless IBM or your reseller informs you otherwise.

During the warranty period IBM or your reseller, if approved by IBM to provide warranty service, will provide repair and exchange service for the Machine, without charge, under the type of service designated for the Machine and will manage and install engineering changes that apply to the Machine.

If a Machine does not function as warranted during the warranty period, and IBM or your reseller are unable to either 1) make it do so or 2) replace it with one that is at least functionally equivalent, you may return it to your place of purchase and your money will be refunded. The replacement may not be new, but will be in good working order.

Extent of Warranty
The warranty does not cover the repair or exchange of a Machine resulting from misuse, accident, modification, unsuitable physical or operating environment, improper maintenance by you, or failure caused by a product for which IBM is not responsible. The warranty is voided by removal or alteration of Machine or parts identification labels.

THESE WARRANTIES ARE YOUR EXCLUSIVE WARRANTIES AND REPLACE ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THESE WARRANTIES GIVE YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM JURISDICTION TO JURISDICTION. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF EXPRESS OR IMPLIED WARRANTIES, SO THE ABOVE EXCLUSION OR LIMITATION MAY NOT APPLY TO YOU. IN THAT EVENT, SUCH WARRANTIES ARE LIMITED IN DURATION TO THE WARRANTY PERIOD. NO WARRANTIES APPLY AFTER THAT PERIOD.

Items Not Covered by Warranty
IBM does not warrant uninterrupted or error-free operation of a Machine.

Unless specified otherwise, IBM provides non-IBM machines **WITHOUT WARRANTIES OF ANY KIND**.

Any technical or other support provided for a Machine under warranty, such as assistance via telephone with "how-to" questions and those regarding Machine set-up and installation, will be provided **WITHOUT WARRANTIES OF ANY KIND**.

Warranty Service
To obtain warranty service for the Machine, contact your reseller or IBM. In the United States, call IBM at 1-800-IBM-SERV (426-7378). In Canada, call IBM at 1-800-465-6666. You may be required to present proof of purchase.

IBM or your reseller provides certain types of repair and exchange service, either at your location or at a service center, to keep Machines in, or restore them to, conformance with their Specifications. IBM or your reseller will inform you of the available types of service for a Machine based on its country of installation. IBM may repair the failing Machine or exchange it at its discretion.

When warranty service involves the exchange of a Machine or part, the item IBM or your reseller replaces becomes its property and the replacement becomes yours. You represent that all removed items are genuine and unaltered. The replacement may not be new, but will be in good working order and at least functionally equivalent to the item replaced. The replacement assumes the warranty service status of the replaced item.

Any feature, conversion, or upgrade IBM or your reseller services must be installed on a Machine which is 1) for certain Machines, the designated, serial-numbered Machine and 2) at an engineering-change level compatible with the feature, conversion, or upgrade. Many features, conversions, or upgrades involve the removal of parts and their return to IBM. A part that replaces a removed part will assume the warranty service status of the removed part.

Before IBM or your reseller exchanges a Machine or part, you agree to remove all features, parts, options, alterations, and attachments not under warranty service.

You also agree to

1. ensure that the Machine is free of any legal obligations or restrictions that prevent its exchange;
2. obtain authorization from the owner to have IBM or your reseller service a Machine that you do not own; and
3. where applicable, before service is provided
   i. follow the problem determination, problem analysis, and service request procedures that IBM or your reseller provides,
   ii. secure all programs, data, and funds contained in a Machine,
   iii. provide IBM or your reseller with sufficient, free, and safe access to your facilities to permit them to fulfill their obligations, and
   iv. inform IBM or your reseller of changes in a Machine's location.

IBM is responsible for loss of, or damage to, your Machine while it is 1) in IBM's possession or 2) in transit in those cases where IBM is responsible for the transportation charges.

Neither IBM nor your reseller is responsible for any of your confidential, proprietary or personal information contained in a Machine which you return to IBM or your reseller for any reason. You should remove all such information from the Machine prior to its return.

Production Status
Each IBM Machine is manufactured from new parts, or new and used parts. In some cases, the Machine may not be new and may have been previously installed. Regardless of the Machine's production status, IBM's appropriate warranty terms apply.

Circumstances may arise where, because of a default on IBM's part or other liability, you are entitled to recover damages from IBM. In each such instance, regardless of the basis on which you are entitled to claim damages from IBM (including fundamental breach, negligence, misrepresentation, or other contract or tort claim), IBM is liable for no more than

1. damages for bodily injury (including death) and damage to real property and tangible personal property; and
2. the amount of any other actual direct damages, up to the greater of U.S. $100,000 (or equivalent in local currency) or the charges (if recurring, 12 months' charges apply) for the Machine that is the subject of the claim.

   This limit also applies to IBM's suppliers and your reseller. It is the maximum for which IBM, its suppliers, and your reseller are collectively responsible.

   UNDER NO CIRCUMSTANCES IS IBM LIABLE FOR ANY OF THE FOLLOWING: 1) THIRD-PARTY CLAIMS AGAINST YOU FOR DAMAGES (OTHER THAN THOSE UNDER THE FIRST ITEM LISTED ABOVE); 2) LOSS OF, OR DAMAGE TO, YOUR RECORDS OR DATA; OR 3) SPECIAL, INCIDENTAL, OR INDIRECT DAMAGES OR FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES (INCLUDING LOST PROFITS OR SAVINGS), EVEN IF IBM, ITS SUPPLIERS OR YOUR RESELLER IS INFORMED OF THEIR POSSIBILITY. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

Statement of Limited Warranty
Part 2 - Country-unique Terms

ASIA PACIFIC

AUSTRALIA: The IBM Warranty for Machines: The following paragraph is added to this Section:
The warranties specified in this Section are in addition to any rights you may have under the Trade Practices Act 1974 or other legislation and are only limited to the extent permitted by the applicable legislation.

Extent of Warranty: The following replaces the first and second sentences of this Section:
The warranty does not cover the repair or exchange of a Machine resulting from misuse, accident, modification, unsuitable physical or operating environment, operation in other than the Specified Operating Environment, improper maintenance by you, or failure caused by a product for which IBM is not responsible.
Limitation of Liability: The following is added to this Section:
Where IBM is in breach of a condition or warranty implied by the Trade Practices Act 1974, IBM's liability is limited to the repair or replacement of the goods or the supply of equivalent goods. Where that condition or warranty relates to right to sell, quiet possession or clear title, or the goods are of a kind ordinarily acquired for personal, domestic or household use or consumption, then none of the limitations in this paragraph apply.

PEOPLE'S REPUBLIC OF CHINA: Governing Law: The following is added to this Statement:
The laws of the State of New York govern this Statement.

INDIA: Limitation of Liability: The following replaces items 1 and 2 of this Section:
1. liability for bodily injury (including death) or damage to real property and tangible personal property will be limited to that caused by IBM's negligence;
2. as to any other actual damage arising in any situation involving nonperformance by IBM pursuant to, or in any way related to the subject of this Statement of Warranty, IBM's liability will be limited to the charge paid by you for the individual Machine that is the subject of the claim.

NEW ZEALAND: The IBM Warranty for Machines: The following paragraph is added to this Section:
The warranties specified in this Section are in addition to any rights you may have under the Consumer Guarantees Act 1993 or other legislation which cannot be excluded or limited. The Consumer Guarantees Act 1993 will not apply in respect of any goods which IBM provides, if you require the goods for the purposes of a business as defined in that Act.

Limitation of Liability: The following is added to this Section:
Where Machines are not acquired for the purposes of a business as defined in the Consumer Guarantees Act 1993, the limitations in this Section are subject to the limitations in that Act.

EUROPE, MIDDLE EAST, AFRICA (EMEA)

The following terms apply to all EMEA countries.

The terms of this Statement of Warranty apply to Machines purchased from an IBM reseller. If you purchased this Machine from IBM, the terms and conditions of the applicable IBM agreement prevail over this warranty statement.

Warranty Service
If you purchased an IBM Machine in Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland or United Kingdom, you may obtain warranty service for that Machine in any of those countries from either (1) an IBM reseller approved to perform warranty service or (2) from IBM.

If you purchased an IBM Personal Computer Machine in Albania, Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Georgia, Hungary, Kazakhstan, Kirghizia, Federal Republic of Yugoslavia, Former Yugoslav Republic of Macedonia (FYROM), Moldova, Poland, Romania, Russia, Slovak Republic, Slovenia, or Ukraine, you may obtain warranty service for that Machine in any of those countries from either (1) an IBM reseller approved to perform warranty service or (2) from IBM.

The applicable laws, Country-unique terms and competent court for this Statement are those of the country in which the warranty service is being provided. However, the laws of Austria govern this Statement if the warranty service is provided in Albania, Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Federal Republic of Yugoslavia, Georgia, Hungary, Kazakhstan, Kirghizia, Former Yugoslav Republic of Macedonia (FYROM), Moldova, Poland, Romania, Russia, Slovak Republic, Slovenia, and Ukraine.

The following terms apply to the country specified:

EGYPT: Limitation of Liability: The following replaces item 2 in this Section:
2. as to any other actual direct damages, IBM's liability will be limited to the total amount you paid for the Machine that is the subject of the claim.

Applicability of suppliers and resellers (unchanged).

FRANCE: Limitation of Liability: The following replaces the second sentence of the first paragraph of this Section:
In such instances, regardless of the basis on which you are entitled to claim damages from IBM, IBM is liable for no more than: (items 1 and 2 unchanged).

GERMANY: The IBM Warranty for Machines: The following replaces the first sentence of the first paragraph of this Section:
The warranty for an IBM Machine covers the functionality of the Machine for its normal use and the Machine's conformity to its Specifications.

The following paragraphs are added to this Section:
The minimum warranty period for Machines is six months.

In case IBM or your reseller are unable to repair an IBM Machine, you can alternatively ask for a partial refund as far as justified by the reduced value of the unrepaired Machine or ask for a cancellation of the respective agreement for such Machine and get your money refunded.

Extent of Warranty: The second paragraph does not apply.

Warranty Service: The following is added to this Section:
During the warranty period, transportation for delivery of the failing Machine to IBM will be at IBM's expense.
Production Status: The following paragraph replaces this Section:
Each Machine is newly manufactured. It may incorporate in addition to new parts, re-used parts as well.

Limitation of Liability: The following is added to this Section:
The limitations and exclusions specified in the Statement of Warranty will not apply to damages caused by IBM with fraud or gross negligence and for express warranty.

In item 2, replace "U.S. $100,000" with "1.000.000 DEM."

The following sentence is added to the end of the first paragraph of item 2:
IBM's liability under this item is limited to the violation of essential contractual terms in cases of ordinary negligence.

IRELAND: Extent of Warranty: The following is added to this Section:
Except as expressly provided in these terms and conditions, all statutory conditions, including all warranties implied, but without prejudice to the generality of the foregoing all warranties implied by the Sale of Goods Act 1893 or the Sale of Goods and Supply of Services Act 1980 are hereby excluded.

Limitation of Liability: The following replaces items one and two of the first paragraph of this Section:
1. death or personal injury or physical damage to your real property solely caused by IBM's negligence; and 2. the amount of any other actual direct damages, up to the greater of Irish Pounds 75,000 or 125 percent of the charges (if recurring, the 12 months' charges apply) for the Machine that is the subject of the claim or which otherwise gives rise to the claim.

Applicability of suppliers and resellers (unchanged).

The following paragraph is added at the end of this Section:
IBM's entire liability and your sole remedy, whether in contract or in tort, in respect of any default shall be limited to damages.

ITALY: Limitation of Liability: The following replaces the second sentence in the first paragraph:
In each such instance unless otherwise provided by mandatory law, IBM is liable for no more than: (item 1 unchanged) 2) as to any other actual damage arising in all situations involving non-performance by IBM pursuant to, or in any way related to the subject matter of this Statement of Warranty, IBM's liability, will be limited to the total amount you paid for the Machine that is the subject of the claim.

Applicability of suppliers and resellers (unchanged).

The following replaces the second paragraph of this Section:

Unless otherwise provided by mandatory law, IBM and your reseller are not liable for any of the following: (items 1 and 2 unchanged) 3) indirect damages, even if IBM or your reseller is informed of their possibility.

SOUTH AFRICA, NAMIBIA, BOTSWANA, LESOTHO, AND SWAZILAND: Limitation of Liability: The following is added to this Section:
IBM's entire liability to you for actual damages arising in all situations involving nonperformance by IBM in respect of the subject matter of this Statement of Warranty will be limited to the charge paid by you for the individual Machine that is the subject of your claim from IBM.

TURKIYE: Production Status: The following replaces this Section:
IBM fulfills customer orders for IBM Machines as newly manufactured in accordance with IBM's production standards.

UNITED KINGDOM: Limitation of Liability The following replaces items 1 and 2 of the first paragraph of this Section:

1. death or personal injury or physical damage to your real property solely caused by IBM's negligence;
2. the amount of any other actual direct damages or loss, up to the greater of Pounds Sterling 150,000 or 125 percent of the charges (if recurring, the 12 months' charges apply) for the Machine that is the subject of the claim or which otherwise gives rise to the claim.

The following item is added to this paragraph:

3. breach of IBM's obligations implied by Section 12 of the Sale of Goods Act 1979 or Section 2 of the Supply of Goods and Services Act 1982.

Applicability of suppliers and resellers (unchanged).

The following is added to the end of this Section:
IBM's entire liability and your sole remedy, whether in contract or in tort, in respect of any default will be limited to damages.

Glossary

ANSI (American National Standards Institute)
ANSI is the lead organization for encouraging and developing technological standards. ANSI represents the United States in the IEC, International Electrotechnical Commission and the ISO, International Standards Organization.

ATA (Advanced Technology Attachment)
ATA is the official name given to the IDE interface by ANSI. See IDE.

ATA-4
ATA-3 standard, with Ultra DMA capability.

Backup
Storing information from a hard drive on another storage area in order to prevent data loss. Tape drives and Zip drives are two common mediums for saving vital information contained on a hard drive.

BIOS (Basic Input/Output System)
The BIOS is the first level of software contained in a computer. It provides basic, low level control for keyboards, video, hard disk drives, and floppy drives. The BIOS provides the initial intelligence allowing the computer system to find an operating system to run.

Boot/Boot-up
To prepare a computer system for operation by loading an operating system.

Capacity
The amount of information, expressed in bytes, that can be stored on a hard drive. Also known as storage capacity.

CMOS
The CMOS is a memory chip which keeps a data record of the components installed in a computer. The CMOS receives a minute flow of power from a small battery which allows it to retain its data, even when the computer's main power is turned off.

Compatibility
The capability of a hardware or software component to conform with the interface requirements of a given data processing system without adversely affecting its functions.

Cylinder
(1) In an assembly of magnetic disks, the set of all tracks that can be accessed by all the magnetic heads of a comb in a given position.
(2) The tracks of a disk storage device that can be accessed without repositioning the access mechanism.

Disk Drive
The primary data storage device used by computers. Disk drives are used to record, store and retrieve digital information in a computer system.

DMA (Direct Memory Access)
Direct memory access is a process for transferring data directly to and from main memory without passing it through the CPU. DMA improves speed and efficiency by allowing the system to continue processing even while it is retrieving new data from the drive.

Dynamic Drive Overlay
Dynamic Drive Overlay is software that overwrites a computer's system BIOS.

Electrostatic Discharge
The rapid change in electrical energy caused by static electricity. This can damage or destroy electronic equipment or hardware. Prevention consists of grounding oneself before handling any electronic equipment.

FAT16/FAT32 (File Allocation Table)
The file allocation table is a group of sectors in a hard drive that contains address chains for the different files on a hard disk drive. There are usually two FATs (kept in different locations) on a hard drive. FAT32 is available in the Windows® 95 & Windows® 98 operating systems. FAT32 receives its designation because it allows 32 bits of addressing as opposed to 16 bits in the FAT16 file system.

FDISK
FDISK is a program run in DOS that allows a user to partition a hard disk drive. Partitioning your hard disk drive is essential for it to work properly.

Format
When a hard disk is formatted, the computer writes a magnetic track pattern onto a disk surface, specifying the locations of the tracks and sectors. This information must exist on a hard disk before it can store data.

FTP (File Transfer Protocol)
In the Internet suite of protocols, an application layer protocol that uses TCP and Telnet services to transfer bulk-data files between machines or hosts.

Hard Disk Drive (HDD)
A stand alone disk drive that reads and writes data on rigid disks and can be attached to a port on the system unit. Synonymous with fixed disk drive, hard drive.

Head
The tiny electromagnetic coil and metal pole used to create and read back magnetic patterns on the disk.

HPFS (High Performance File System)
HPFS is the file system used by OS/2.

IDE (Integrated Drive Electronics)
Also known as ATA (Advanced Technology Attachment) by ANSI. IDE technology was developed to overcome CMOS limitations in older computers. IDE is used as one of the standard interfaces between a computer's input/output devices and the motherboard. Although it can be used with other bus standards the IDE interface was originally based on the IBM PC ISA16 bit bus standard. The nature of the IDE interface allows for only two components to be attached to each bus; one designated master and the other slave. The IDE bus is unterminated, therefore, an IDE cable cannot exceed 18 inches.

Interface
A hardware of software protocol (contained in the electronics of the disk controller and drive) that manages the exchange of data between the hard disk drive and the computer. The most common interfaces for small computer systems are ATA (IDE) and SCSI.

Jumpers and Jumper Settings
Jumpers are small pieces of plastic with a conductive center. Jumpers are used to connect pins on a device to provide settings that are changeable by the user, but remain constant during operation.

Master Drive
Master refers to the primary device (usually a hard disk drive) in an ATA interface.

Motherboard
The Motherboard holds the computer's main processors and circuitry. It also contains the memory, BIOS, interconnection circuitry and the expansion slots.

NTFS (NT File System)
NTFS is an advanced file system used by Windows NT.

Operating System
Software that controls the execution of programs and that may provide services such as resource allocation, scheduling, input/output control, and data management. Although operating systems are predominantly software, partial hardware implementations are possible.

OS/2
OS/2 is an IBM operating system. It is a fully preemptive, multitasking operating system. OS/2 also supports HPFS, a very advanced file system.

Partition
A portion of a hard drive dedicated to a particular operating system or application and accessed as a single logical volume.

PIO (Programmed input/output)
PIO is the original operating mode for most hard disk drives. PIO uses the CPU to manage the transfer of data from the hard drive to memory.

Sector
On an ATA drive, the minimum segment of track length that the hard disk drive can assign to store information.

Slave
Slave is the term given to the second device on an ATA cable.

Slave Present
Slave present is a setting on some hard disk drives that is to be used when the drive is a Master device. It allows the Slave device on the same bus adequate time to identify itself.

Track
One of the many concentric magnetic circle patterns written on a disk surface as a guide for storing and reading data.

Ultra DMA (Ultra DMA/33)
A protocol for transferring data between a hard disk drive and the main memory without passing it through the CPU. It allows transmission of data at up to 33.3 MB/sec.

Wipe
Wipe is a software utility that writes zeros to every sector on a hard disk drive up to 8 GB.

Windows® NT
Microsoft’s 32-bit server operating system.

Windows® 98
Microsoft operating system.

Zap
A utility in which the first 128 sectors of a hard drive are overwritten with zeros.

Zip Drive
A Zip drive uses increased real density on floppy disk technology to increase storage capacity. Zip diskettes have a storage capacity of 100 MB and therefore are an attractive backup option.

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